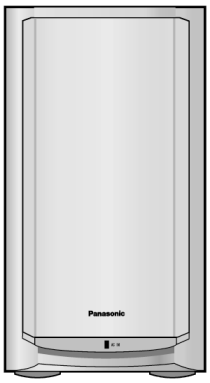
ORDER NO. MD0411542C1
A6

Service Manual

Active Subwoofer System



SB-WA730

SB-WA730PP

Colour

(S)...Silver Type

Specification

n Active subwoofer

Type	1 way, 2 speaker system, Bass reflex
Speaker unit(s)	
1. Woofer	13 cm (5-1/8") Cone type, 4Ω
2. Woofer	13 cm (5-1/8") Cone type, 4Ω
Output sound pressure level	80 dB/W (1.0 m)
Frequency range	40 Hz-220 Hz (-16 dB)
	45 Hz-180 Hz (-10 dB)
Dimensions (W x H x D)	201.5 x 368.2 x 491.5 mm
	(7-15/16" x 14-1/2" x 19-3/8")
Mass	11.3 kg (24.9 lbs)

n General

Power consumption	340 W
Power supply	AC 120V, 60Hz

Note :

Specifications are subject to change without notice.

Mass and dimensions are approximate.

SB-HT730P-S consists of :

SB-FS730P-S X 2, SB-FS731P-S x 2 and SB-PC730P-S x 1

n System : SC-HT730P-S	Music Center: SA-HT730P-S
	Satellite Speakers: SB-HT730P-S
	Active Subwoofer: SB-WA730PP-S
n System : SC-HT730PC-S	Music Center: SA-HT730PC-S
	Satellite Speakers: SB-HT730P-S
	Active Subwoofer: SB-WA730PP-S

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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Panasonic

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1 Safety Precautions

1.1. GENERAL GUIDELINES

1. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
2. After servicing, ensure that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
3. After servicing, check for leakage current to prevent from being exposed to shock hazards.

(This “Safety Precaution” is applied only in U.S.A.)

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer’s recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

1.1.1. LEAKAGE CURRENT COLD CHECK

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Using an ohmmeter measure the resistance value, between the jumpered AC plug and each exposed metallic cabinet part on the equipment such as screwheads, connectors, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be between 1MΩ and 5.2Ω.
   When the exposed metal does not have a return path to the chassis, the reading must be ∞ .

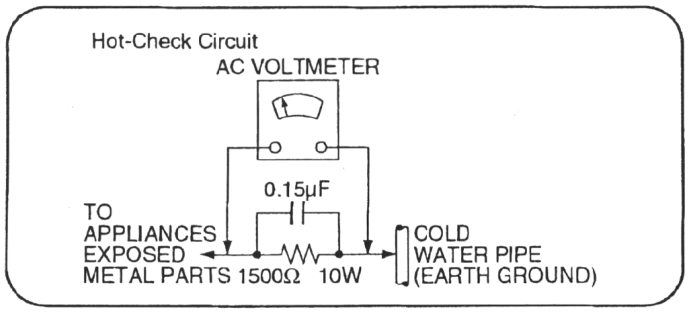


Fig. 1

1.1.2. LEAKAGE CURRENT HOT CHECK (See Figure 1.)

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a 1.5kΩ, 10 watts resistor, in parallel with a 0.15μF capacitors, between each exposed metallic part on the set and a good earth ground such as a water pipe, as shown in Figure 1.
3. Use an AC voltmeter, with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reverse the AC plug in the AC outlet and repeat each of the above measurements.
6. The potential at any point should not exceed 0.75 volts RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot checks, leakage current must not exceed 1/2 milliamp. Should the measurement is outside of the limits specified, there is a possibility of a shock hazard, and the equipment should be examine and rechecked before it is returned to the customer.

1.1.3. Caution for fuse replacement

(For English)
CAUTION:

Replace with the same type fuse:
(Manufacturer: HOLLYLAND Co. Ltd. Type: F1, 5A, 125V)

(For Canadian French)
ATTENTION:

Utiliser un fusible de rechange de même type:
(Fabricant: HOLLYLAND Co. Ltd. Type: F1, 5A, 125V)

2 Handling the Lead-free Solder

2.1. About lead free solder (PbF)

Distinction of PbF P.C.B. :

P.C.B.s (manufactured) using lead free solder will have a PbF stamp on the P.C.B.

Caution:

- Pb free solder has a higher melting point than standard solder: Typically the melting point is 50 - 70°F (30 - 40°C) higher. Please use a high temperature soldering iron. In case of the soldering iron with temperature control, please set it to 700 ± 20°F (370 ± 10°C).
- Pb free solder will tend to splash when heated too high (about 1100°F/600°C).
- When soldering or unsoldering, please completely remove all of the solder on the pins or solder area, and be sure to heat the soldering points with the Pb free solder until it melts enough.

3 Before Repair and Adjustment

Disconnect AC power, discharge Power Supply Capacitors C546, C547, C548, C549 through a 10 Ω, 1 W resistor to ground.

DO NOT SHORT-CIRCUIT DIRECTLY (with a screwdriver blade, for instance), as this may destroy solid state devices.

After repairs are completed, restore power gradually using a variac, to avoid overcurrent.

Current consumption at AC 120V, 60Hz in NO SIGNAL mode (volume at min) should be ~750 mA .

4 Protection Circuitry

The protection circuitry may have operated if either of the following conditions are noticed:

- No sound is heard when the power is turned on.
- Sound stops during a performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are “shorted”, or if speaker systems with an impedance less than the indicated rated impedance of the amplifier are used.

If this occurs, follow the procedure outlines below:

1. Turn off the power.
2. Determine the cause of the problem and correct it.
3. Turn on the power once again after one minute.

Note :

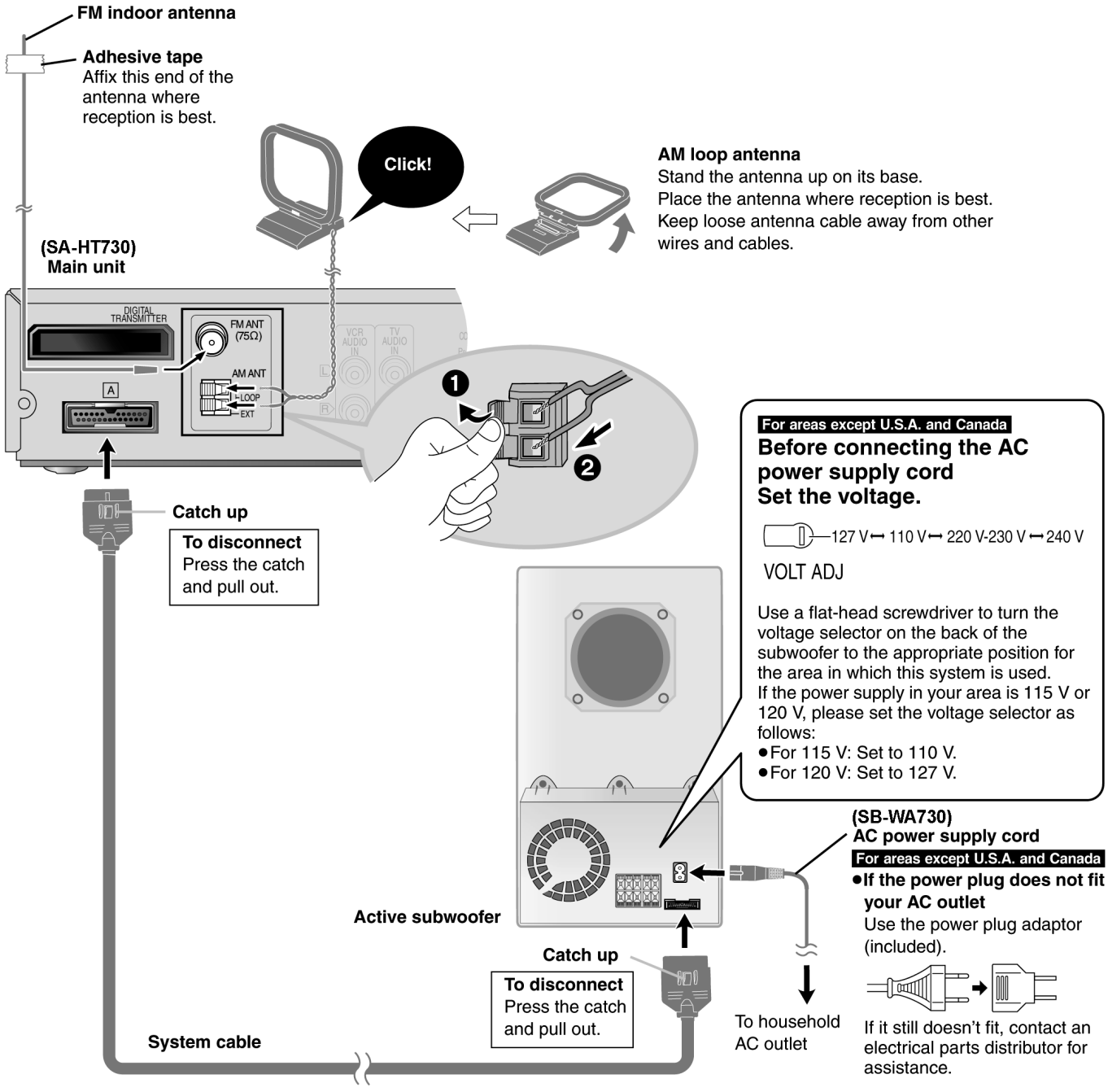
When the protection circuitry functions, the unit will not operate unless the power is first turned off and then on again.

5 Connection of the Speaker Cables

- Be sure to connect speaker cables before connecting the AC power supply cord.
- The load impedance of any speaker used with this unit must be 4Ω.
- Be sure to connect the cable from the right speaker to the right terminal and the cable from the left speaker to the left terminal.

1. Strip off the outer covering, and twist the center conductor. Make sure the bare ends of the wires are not unravelled. (If they are, twist them tight again.)
2. Insert the wire to the rear panel of the unit and close the lever.

●Connect the AC power supply cord after all other connections are complete.
●Optional antenna connections


FM indoor antenna
Adhesive tape
Affix this end of the antenna where reception is best.
Click!
AM loop antenna
Stand the antenna up on its base.
Place the antenna where reception is best.
Keep loose antenna cable away from other wires and cables.
(SA-HT730)
Main unit
DIGITAL TRANSMITTER
FM ANT (75Ω)
AM ANT
LOOP
EXT
VCR AUDIO IN
TV AUDIO IN
1
2
Catch up
To disconnect
Press the catch and pull out.
For areas except U.S.A. and Canada
Before connecting the AC power supply cord
Set the voltage.
127 V 110 V 220 V-230 V 240 V
VOLT ADJ
Use a flat-head screwdriver to turn the voltage selector on the back of the subwoofer to the appropriate position for the area in which this system is used.
If the power supply in your area is 115 V or 120 V, please set the voltage selector as follows:
●For 115 V: Set to 110 V.
●For 120 V: Set to 127 V.
(SB-WA730)
AC power supply cord
For areas except U.S.A. and Canada
●If the power plug does not fit your AC outlet
Use the power plug adaptor (included).
If it still doesn't fit, contact an electrical parts distributor for assistance.
Active subwoofer
Catch up
To disconnect
Press the catch and pull out.
To household AC outlet
System cable

6 Disassembly Procedure

“ATTENTION SERVICER”

Some chassis components may have sharp edges.

Be careful when disassembling and servicing.

1. **This section describes procedures for checking the operation of the major printed circuit boards and replacing the main components.**
2. **For reassembly after operation checks or replacement, reverse the respective procedures.**

   Special reassembly procedures are described only when required.
3. **Select items from the following index when checks or replacement are required.**

Contents

· **Disassembly of the Speaker Unit and Checking of the P.C.B.**

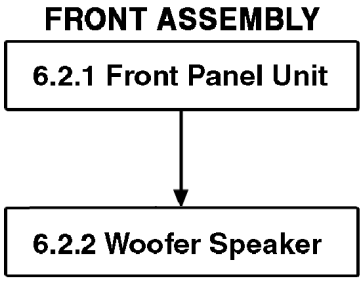
· **Main Component Replacement Procedures**

6.1. Disassembly flow chart

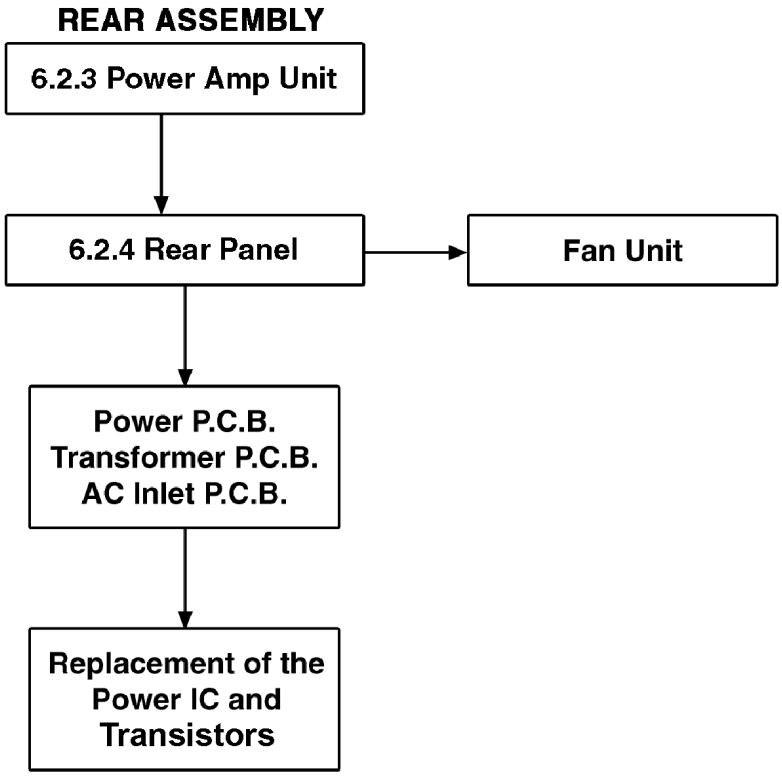
The following chart is the procedure for disassembling the casing and inside parts for internal inspection when carrying out the servicing.

To assemble the unit, reverse the steps shown in the chart below.

6.1.1.

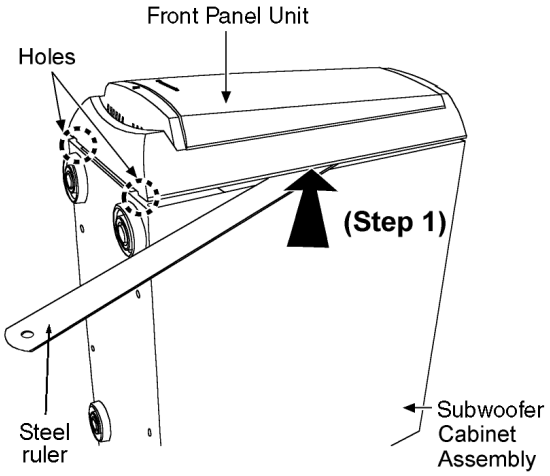


6.1.2.

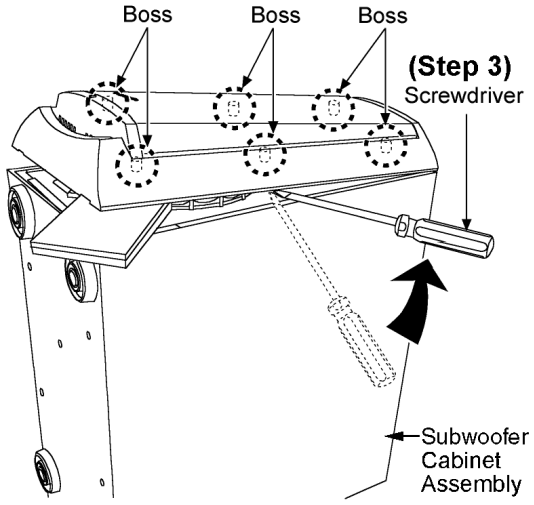

REAR ASSEMBLY
6.2.3 Power Amp Unit
6.2.4 Rear Panel
Fan Unit
Power P.C.B.
Transformer P.C.B.
AC Inlet P.C.B.
Replacement of the
Power IC and
Transistors

6.2. Disassembly of the Speaker Unit and Checking of the P.C.B.

6.2.1. Disassembly of the Front Panel Unit



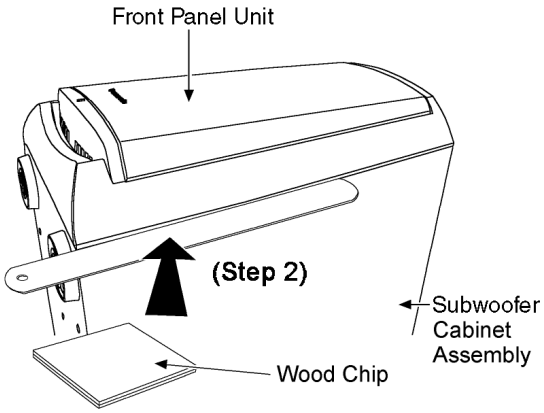
Step 1: Slot in a steel ruler to give a gap between the Front Panel Unit and the Subwoofer Cabinet Assembly as arrow shown.



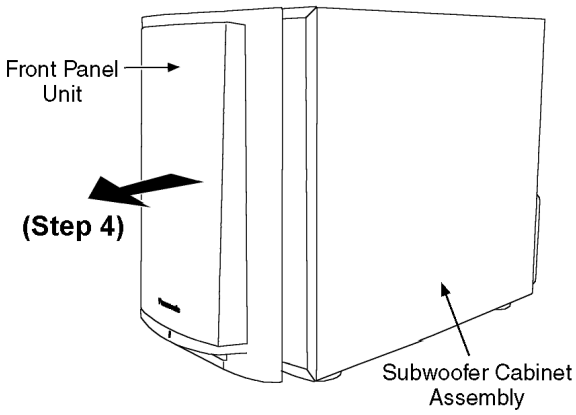
Step 3: Use the screwdriver to slightly lift up the Front Panel Unit as arrow shown.

Note:

Be careful with the bosses which are glued to the Subwoofer Cabinet Assembly.

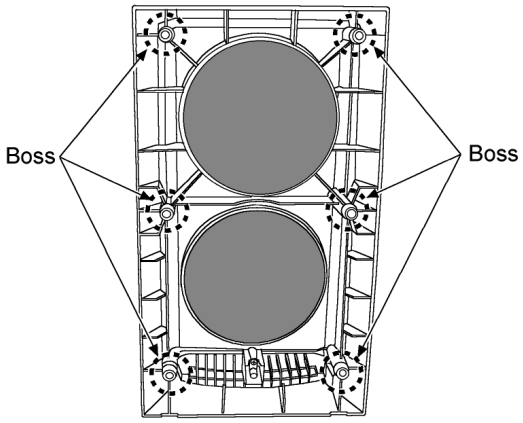


Steps 2: Slot a piece of wood chip in between the Front Panel Unit and the steel ruler as arrow shown.

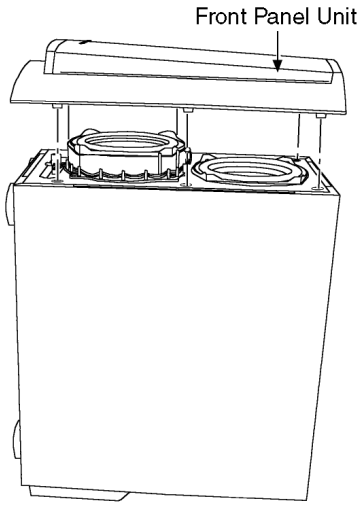


Step 4: Remove the Front Panel Unit from the Subwoofer Cabinet Assembly.

・Assembly of the Front Panel Unit.



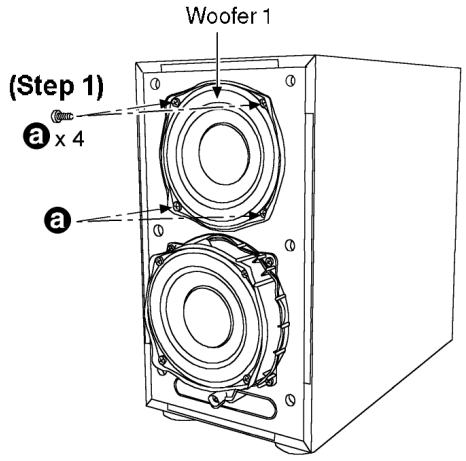
Step 1: Clean up all the glue at the 6 Boss points and replace with the normal glue.



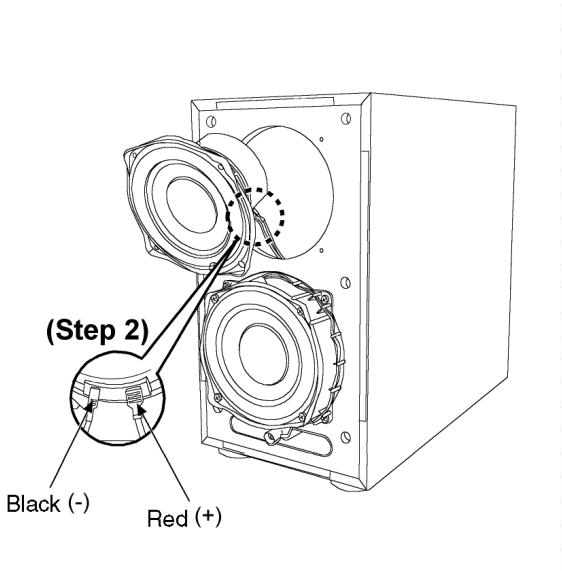
Step 2: Replace the Front Panel Unit firmly back to the cabinet.

6.2.2. Disassembly of the Woofer Speaker Unit

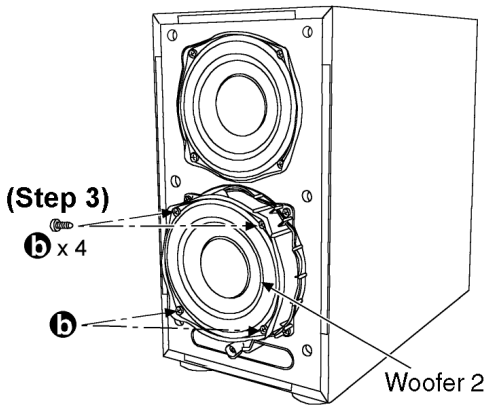
Follow Step (1) to Step (4) described in section 6.2.1.



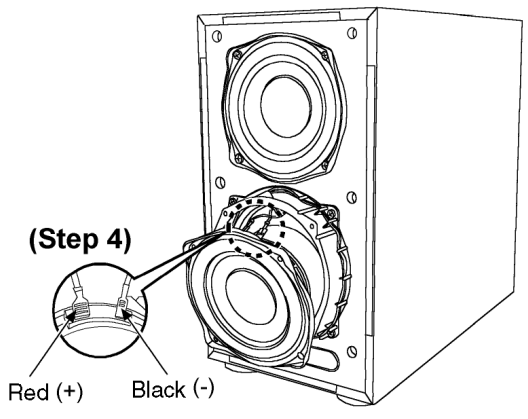
Step 1: Remove 4 screws from the Woofer 1.



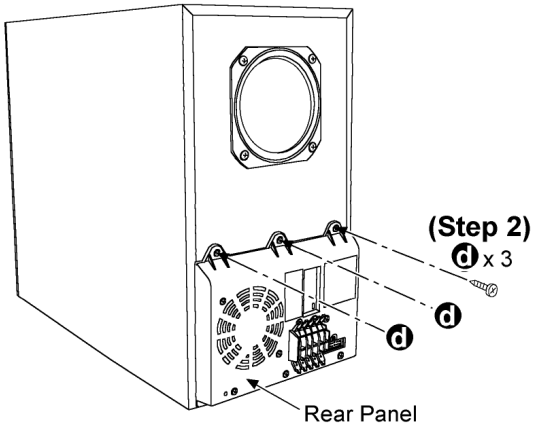
Step 2: Remove the Woofer 1 by detaching wires the (+) and (-).



Step 3: Remove 4 screws from the Woofer 2.

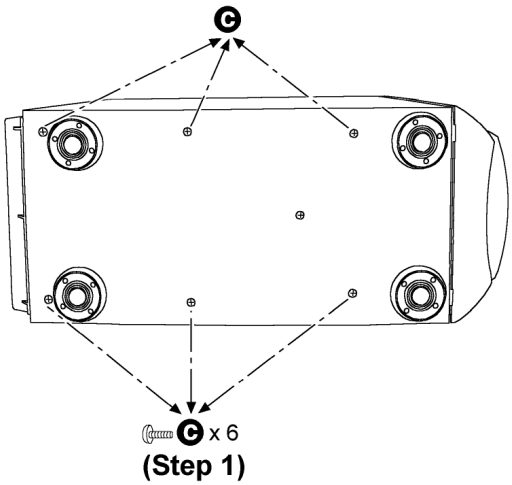


Step 4: Remove the Woofer 2 by detaching the wires (+) and (-).

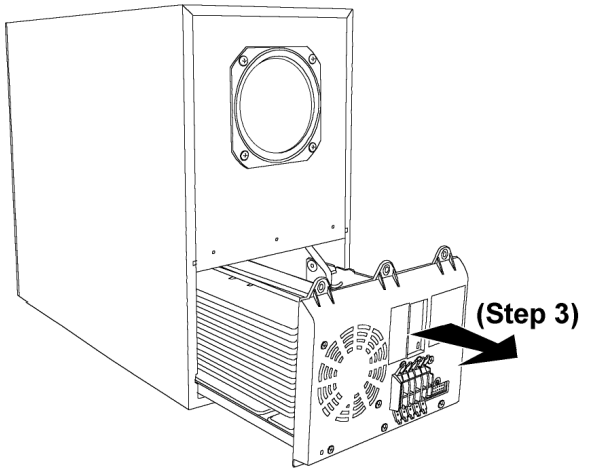


Step 2: Remove 3 screws from the rear panel.

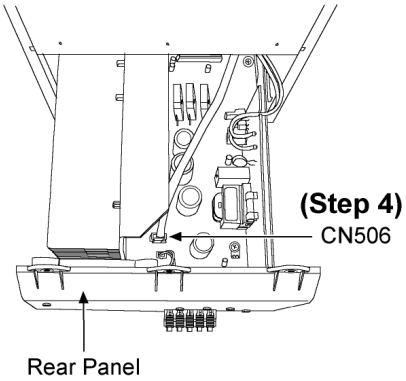
6.2.3. Disassembly of the Power Amp Unit



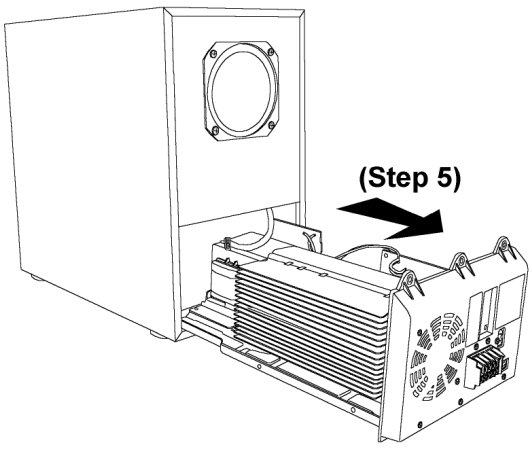
Step 1: Lay the speaker unit as shown. Remove 6 screws from the bottom of the woofer unit.



Step 3: Pull out the Power Amp Unit slightly as shown.



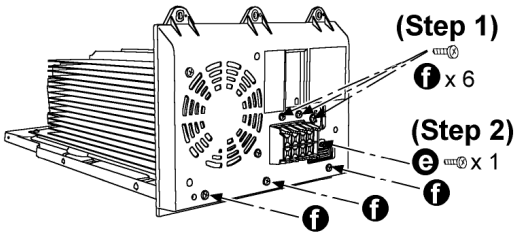
Step 4: Disconnect connector CN506.



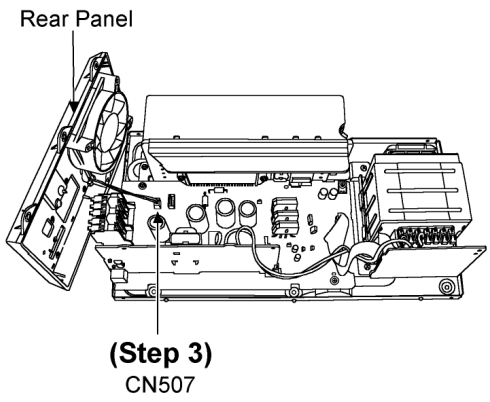
Step 5: Pull out the entire Power Amp Unit.

6.2.4. Disassembly of the Rear Panel and Fan Unit

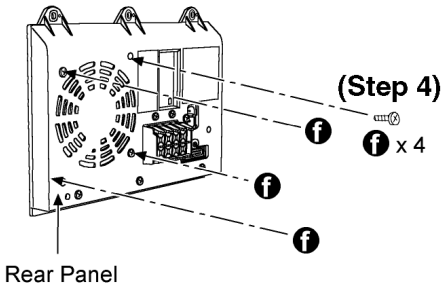
Follow Step (1) to Step (5) described in section 6.2.3.



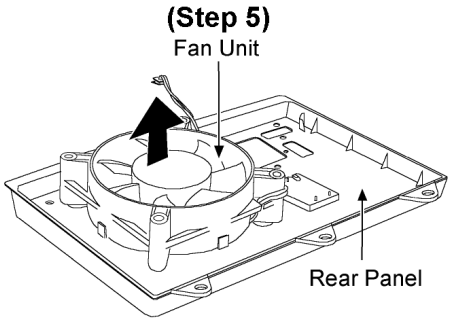
Step 1 & 2: Remove 7 screws from the rear panel.



Step 3: Disconnect the connector (CN507) to detach the rear panel.



Step 4: Remove 4 screws from the rear panel.

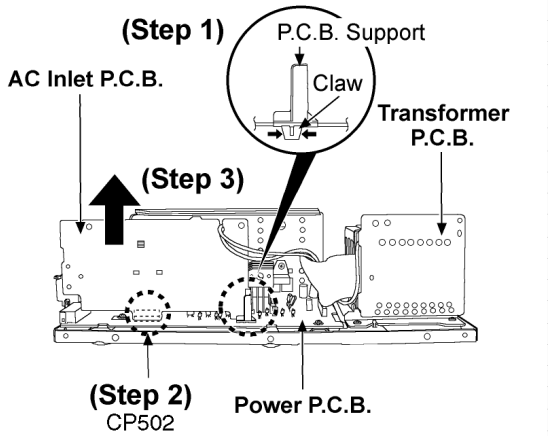


Step 5: Lay the rear panel and remove the Fan Unit as arrow shown.

6.2.5. Disassembly and checking of the AC Inlet P.C.B., Power P.C.B. and Transformer P.C.B.

Follow Step (1) to Step (5) described in section 6.2.3.

Follow Step (1) to Step (5) described in section 6.2.4.

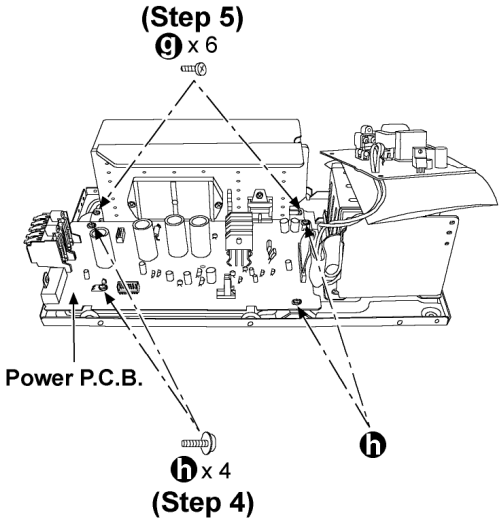


Step 1: Remove the P.C.B. support by pushing the claws as

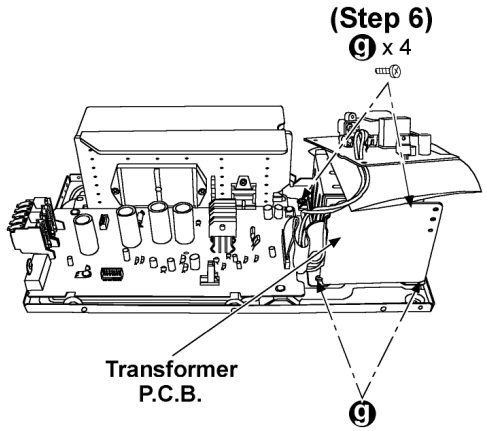
arrow shown.

Step 2: Disconnect the connector (CP502).

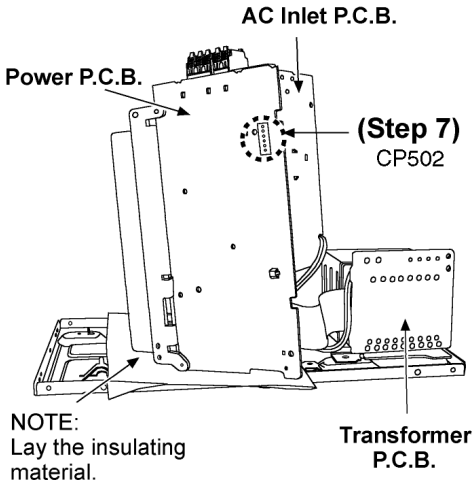
Step 3: Lift up the AC Inlet P.C.B. as arrow shown.



Step 4 & 5: Remove 8 screws.

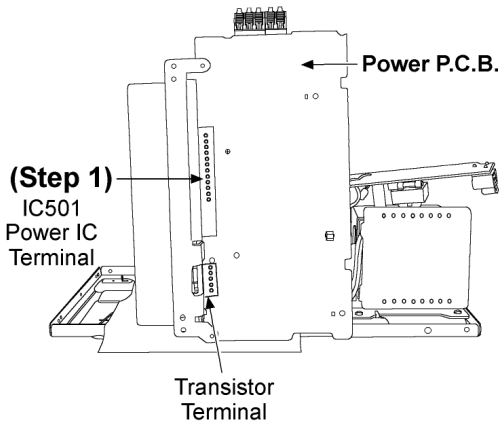


Step 6: Remove 4 screws.

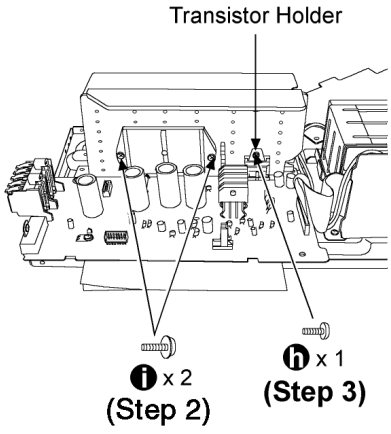


Step 7: Connect back the connector CP502 between Power AC Inlet P.C.B. for checking.

6.2.6. Replacement of Power IC and Transistor

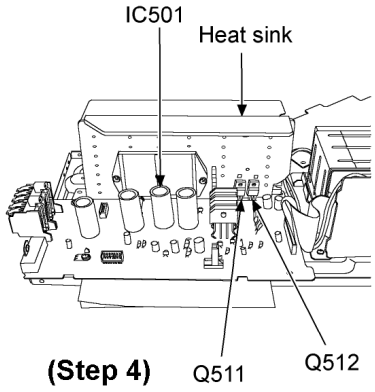


Step 1: Desolder the Power IC and Transistor terminal.



Step 2: Remove 2 screws. and Power IC501.

Step 3: Remove the screw and Transistor holder.



Step 4: Detach the Power IC and Transistor from Heat sink.

7 Voltage Measurement and Waveform Chart

7.1. Voltage Measurement

INLET P.C.B.

Ref No.	Q515				Q516				Q517				Q519							
MODE	E	C	B		E	C	B		E	C	B		E	C	B					
CD PLAY	0	0.1	0.8		0	2.9	-0.4		6.0	12.5	6.6		0	0.8	0					
STANDBY	0	6.0	0		0	2.9	-0.4		6.0	8.9	6.6		0	0	0					

TRANSFORMER P.C.B.

Ref No.	IC501																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
CD PLAY	0	0	63.2	-63.1	0	30.4	-30.4	0	-0.1	0	0	0	0	-0.2	30.7	-30.7	-10.5	0	0	63.3
STANDBY	0	0	16.3	0.3	0	0	0	0	0	0	0	0	0	0	-0.2	0	0	0	0	17.3

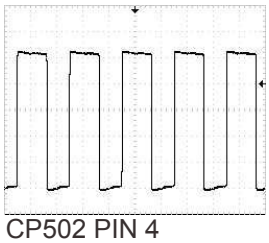
Ref No.	IC501																			
MODE	21	22	23	24	25	26														
CD PLAY	-63.2	0	0	0	0	0														
STANDBY	0.4	0	0	0	0	0														

Ref No.	Q501				Q502				Q503				Q505				Q506			
MODE	E	C	B		E	C	B		1	2	3		E	C	B		E	C	B	
CD PLAY	0	5.1	0		0	5.1	0		0	0.1	-1.6		0	0.8	0		0.8	0	0.8	
STANDBY	0	0.6	0		0	0.6	0		0	0	0.7		0	-0.2	0		-0.2	0	-0.2	

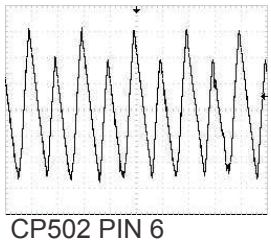
Ref No.	Q511				Q512				Q520				Q552				Q553			
MODE	E	C	B		E	C	B		E	C	B		E	C	B		E	C	B	
CD PLAY	5.2	30.7	5.6		-11.4	-30.7	-11.9		0	-2.0	0		0	-11.4	0.2		-11.4	5.1	-11.4	
STANDBY	0.3	-0.2	-0.2		0.1	0	0		3.7	3.7	0		0	0	0		0	0.3	0	

Ref No.	Q554				Q555				Q556				Q557							
MODE	E	C	B		E	C	B		E	C	B		E	C	B					
CD PLAY	5.2	-	4.7		4.7	5.2	-		0	0.4	-0.2		0.4	5.1	0					
STANDBY	0.3	0	0.2		0.5	0.3	0		0	0.3	0		0.3	0.6	0					

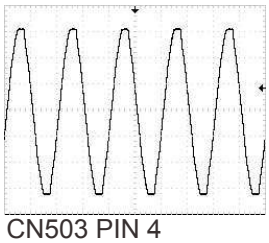
7.2. Waveform



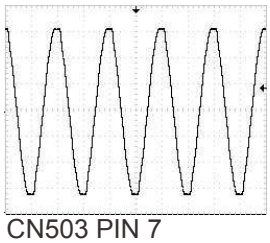
CP502 PIN 4
CD PLAY
5.32Vp-p (10msec.div)



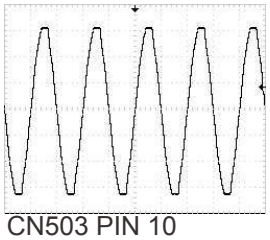
CP502 PIN 6
CD PLAY
1.18Vp-p (10msec.div)



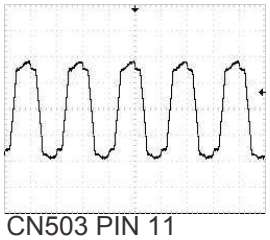
CN503 PIN 4
CD PLAY
63.6Vp-p (10msec.div)



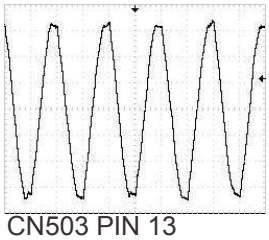
CN503 PIN 7
CD PLAY
63.6Vp-p (10msec.div)



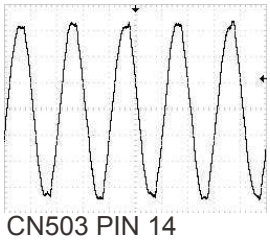
CN503 PIN 10
CD PLAY
128Vp-p (10msec.div)



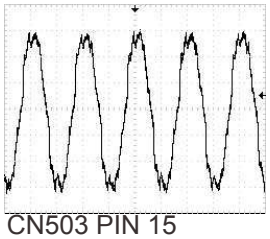
CN503 PIN 11
CD PLAY
18.8Vp-p (10msec.div)



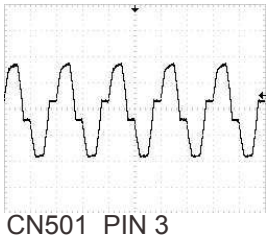
CN503 PIN 13
CD PLAY
6.88Vp-p (10msec.div)



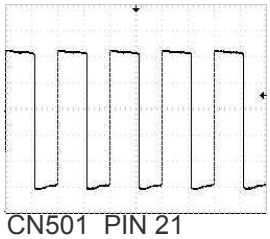
CN503 PIN 14
CD PLAY
6.84Vp-p (10msec.div)



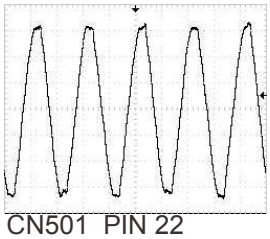
CN503 PIN 15
CD PLAY
628mVp-p (10msec.div)



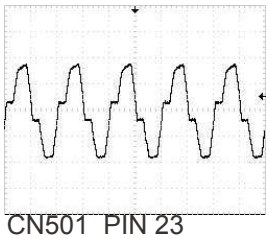
CN501 PIN 3
CD PLAY
18.0Vp-p (10msec.div)



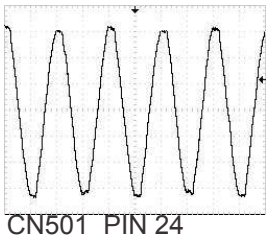
CN501 PIN 21
CD PLAY
5.32Vp-p (10msec.div)



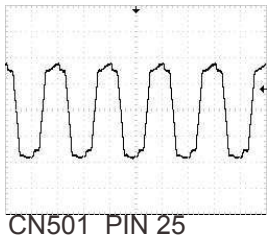
CN501 PIN 22
CD PLAY
6.76Vp-p (10msec.div)



CN501 PIN 23
CD PLAY
18.0Vp-p (10msec.div)

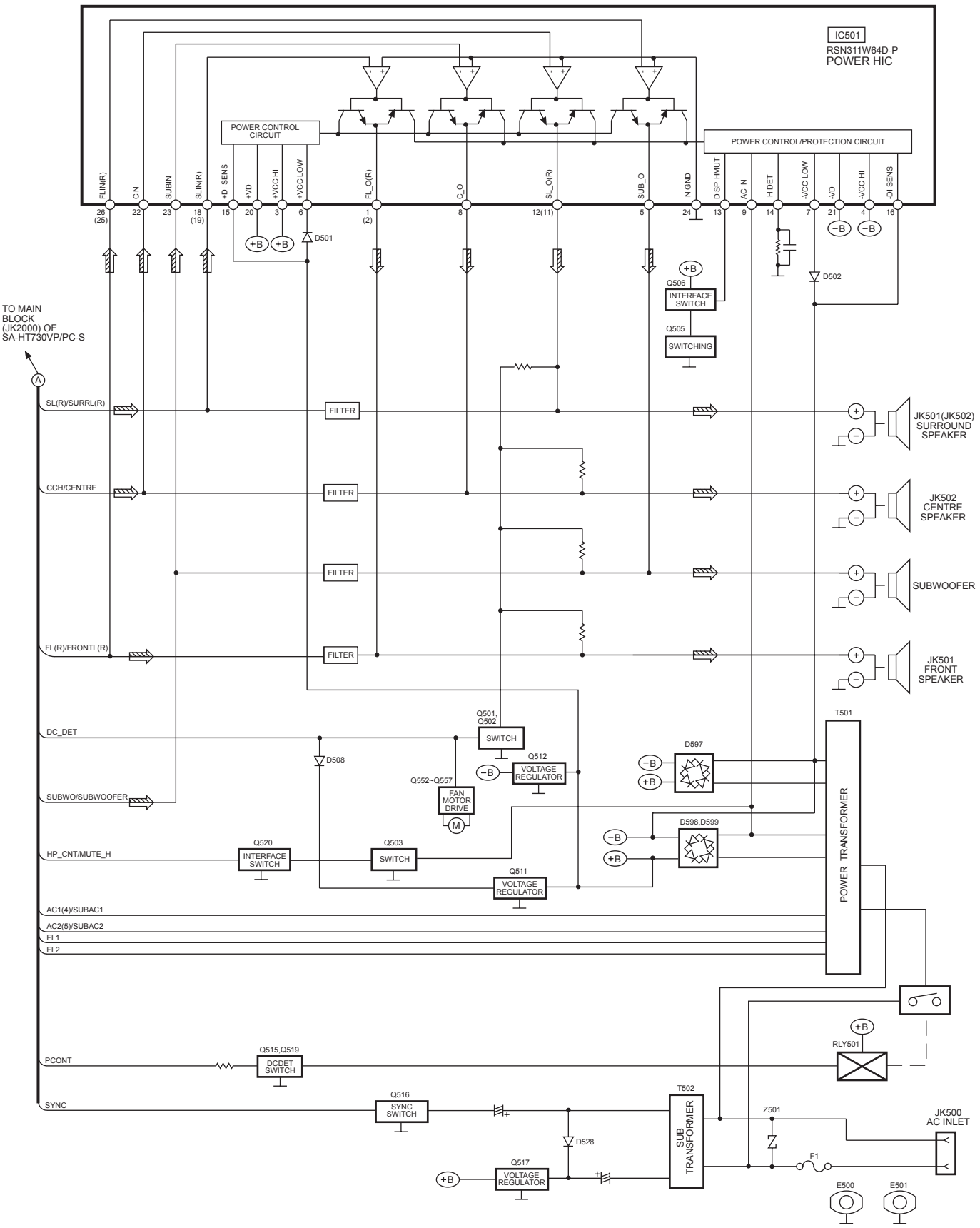


CN501 PIN 24
CD PLAY
6.60Vp-p (10msec.div)



CN501 PIN 25
CD PLAY
18.4Vp-p (10msec.div)

8 Block Diagram



SIGNAL LINES

: MAIN SIGNAL LINE

( ) Indicates Pin No. of Right Channel Note : Signal Lines are applicable to the Left Channel only.

9 Notes of Schematic Diagram

(All schematic diagrams may be modified at any time with the development of the new technology)

Note:

- The voltage value and waveforms are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis. Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
- **Importance safety notice :**

  Components identified by ⚠ mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer´s specified parts shown in the parts list.

Caution !

IC, LSI and VLSI are sensitive to static electricity.

Secondary trouble can be prevented by taking care during repair.

- Cover the parts boxes made of plastics with aluminium foil.
- Put a conductive mat on the work table.
- Ground the soldering iron.
- Do not touch the pins of IC, LSI or VLSI with fingers directly.

CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH SAME TYPE F1 5A , 125V FUSE.

RISK OF FIRE-REPLACE FUSE AS MARKED.

FUSE CAUTION

These symbols located near the fuse indicates that the fuse used is a fast operating type. For continued protection against fire harzard, replace with the same type fuse. For fuse rating, refer to the marking adjacent to the symbol.

Ce symbole indique que le fusible utilisé est à rapide. Pour une protection permanente, n' utiliser que des fusibles de même type. Ce dernier est indiqué là qù le présent symbole est apposé.

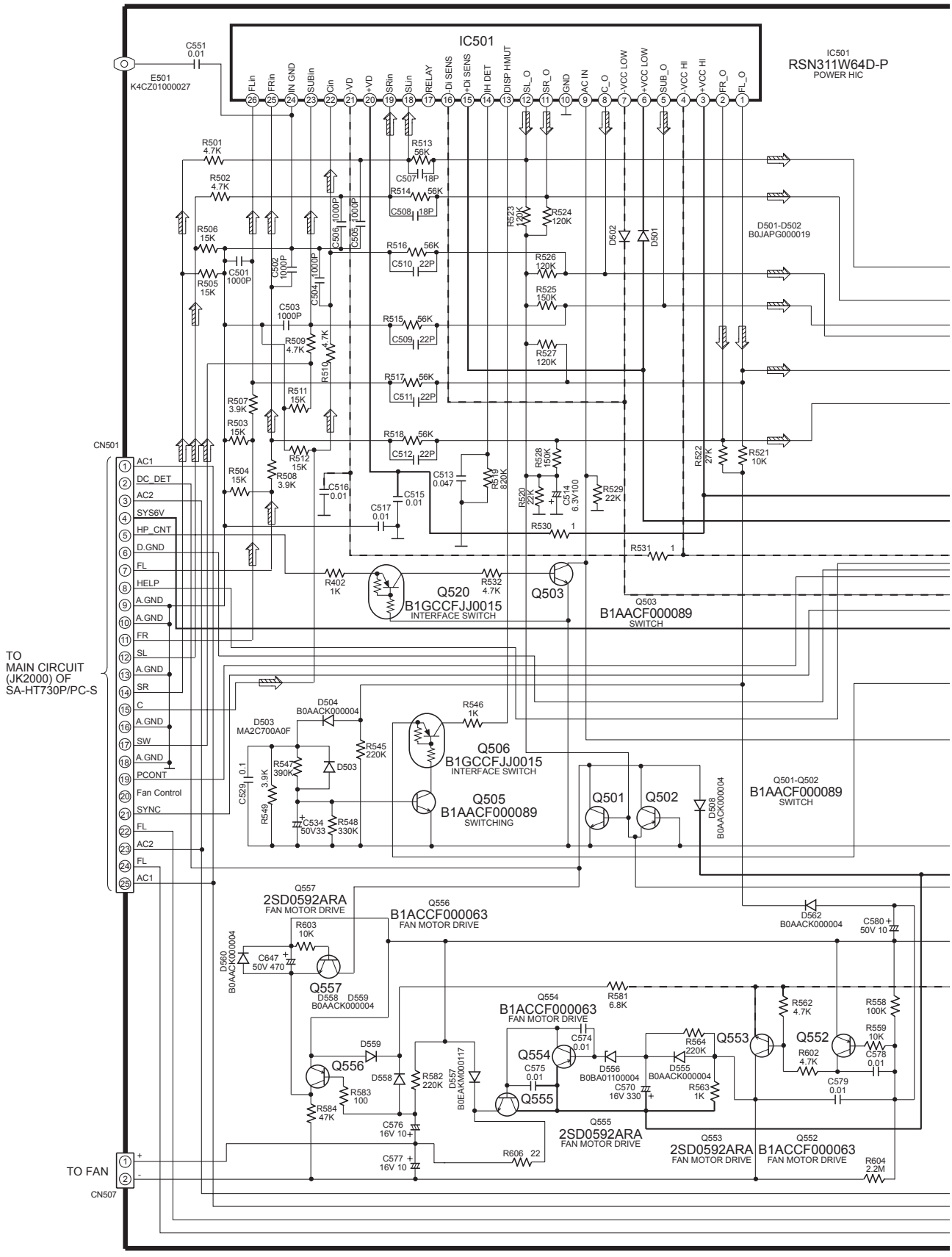
10 Schematic Diagram

10.1. Power Circuit

SCHEMATIC DIAGRAM-1

A POWER CIRCUIT

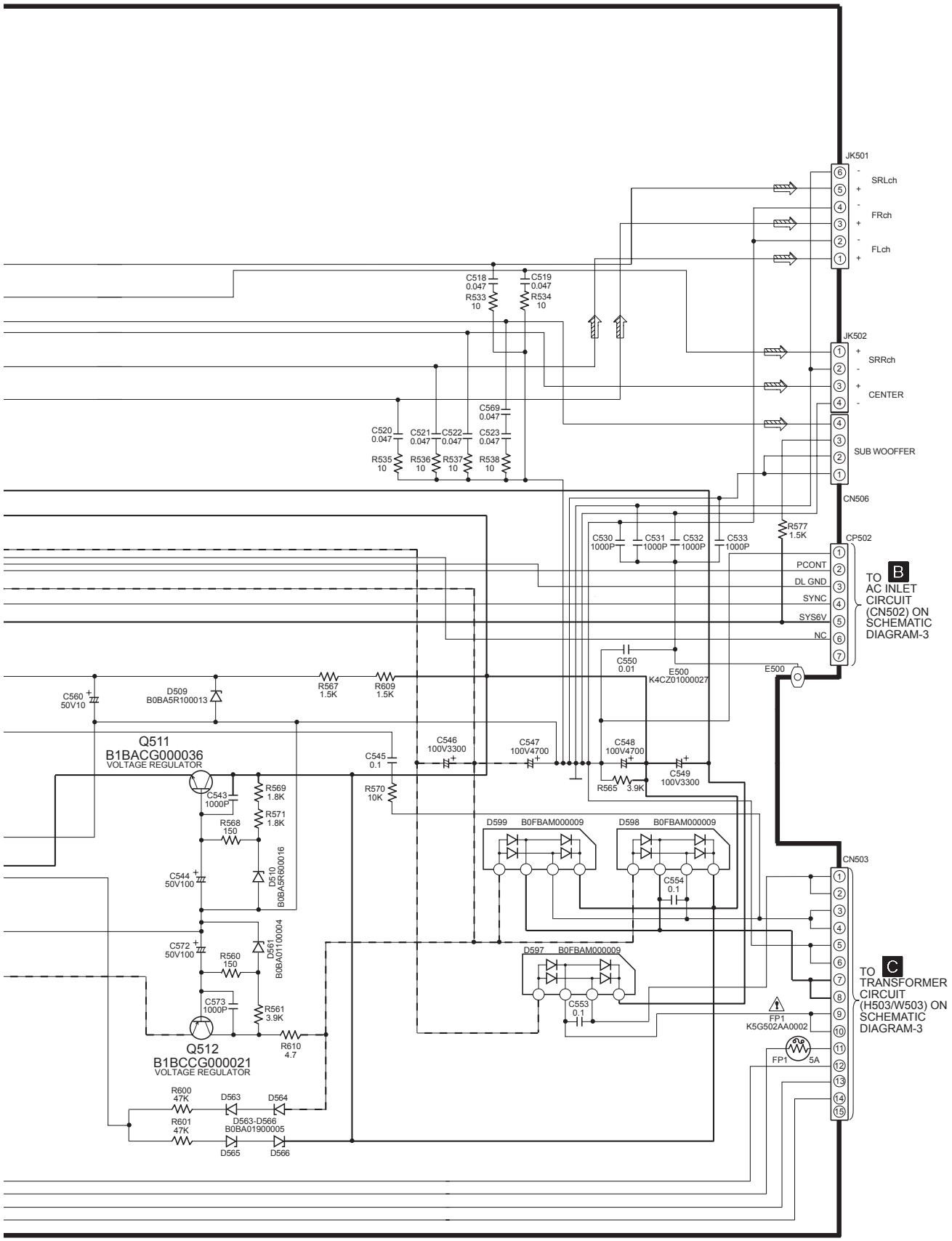
: -B SIGNAL LINE
: +B SIGNAL LINE
: MAIN SIGNAL LINE



SCHEMATIC DIAGRAM-2

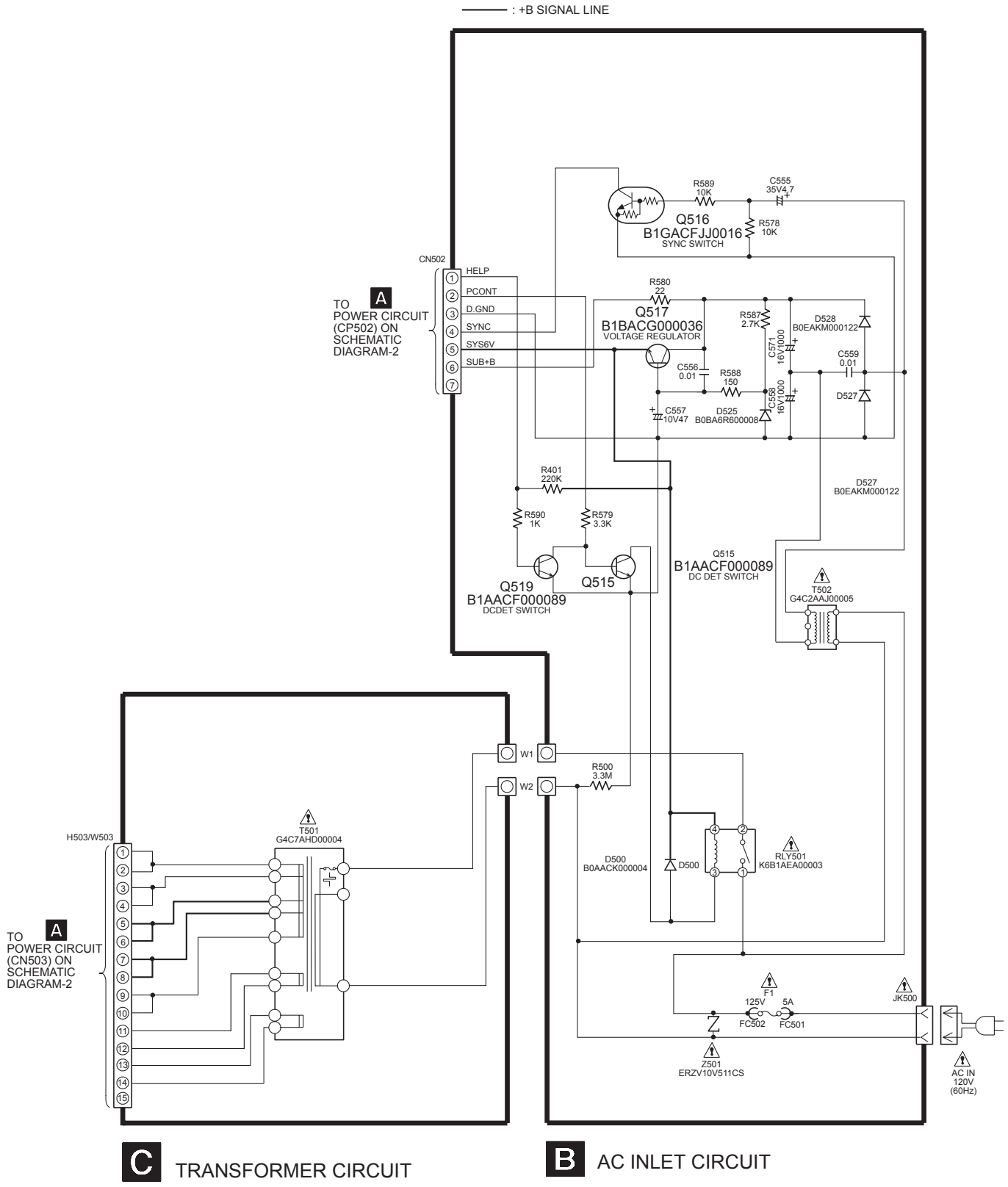
A POWER CIRCUIT

: -B SIGNAL LINE
: +B SIGNAL LINE
: MAIN SIGNAL LINE



10.2. Transformer Circuit and AC Inlet Circuit

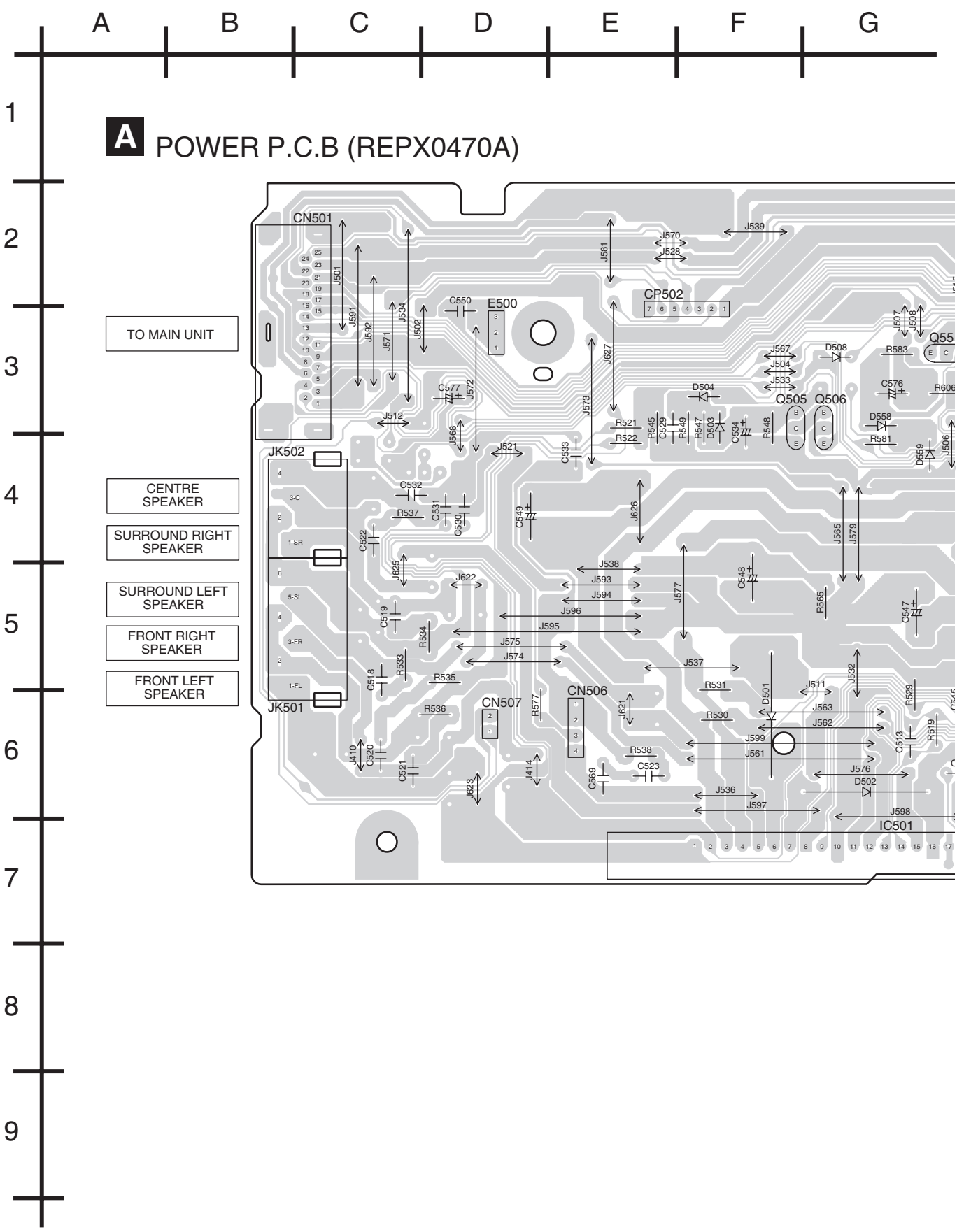
SCHEMATIC DIAGRAM-3



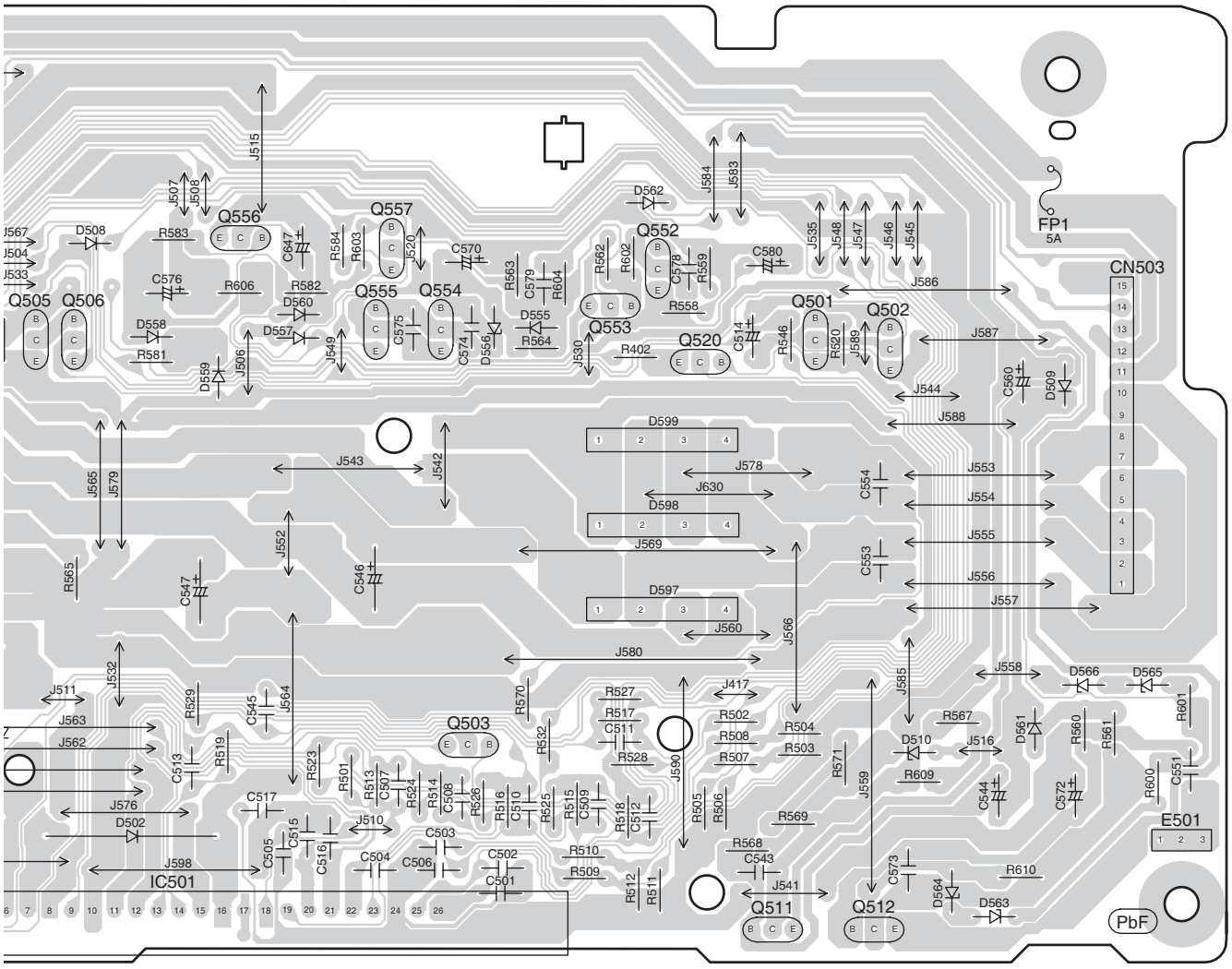
11 Printed Circuit Board

11.1. Power P.C.B.

A POWER P.C.B (REPX0470A)



G H I J K L M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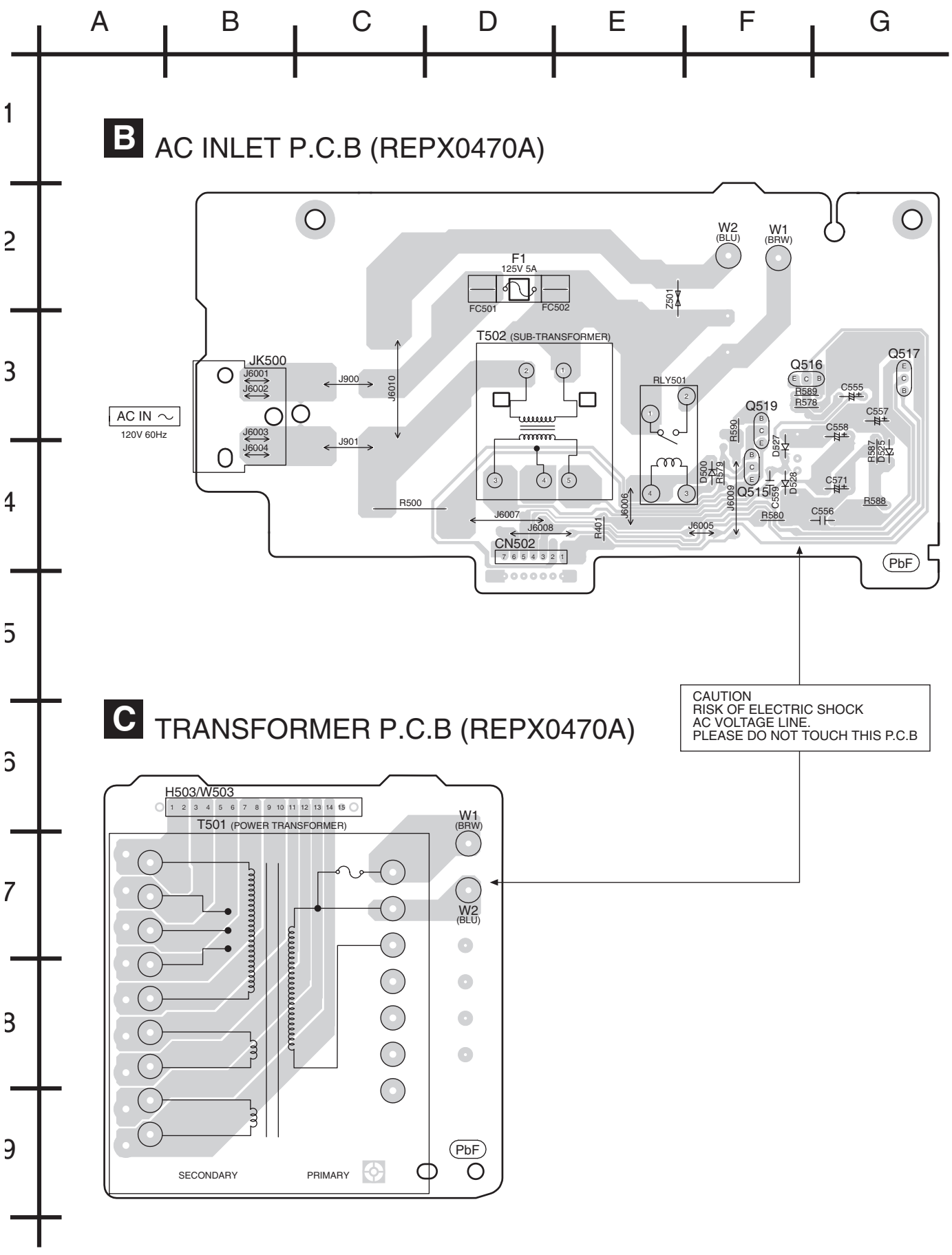
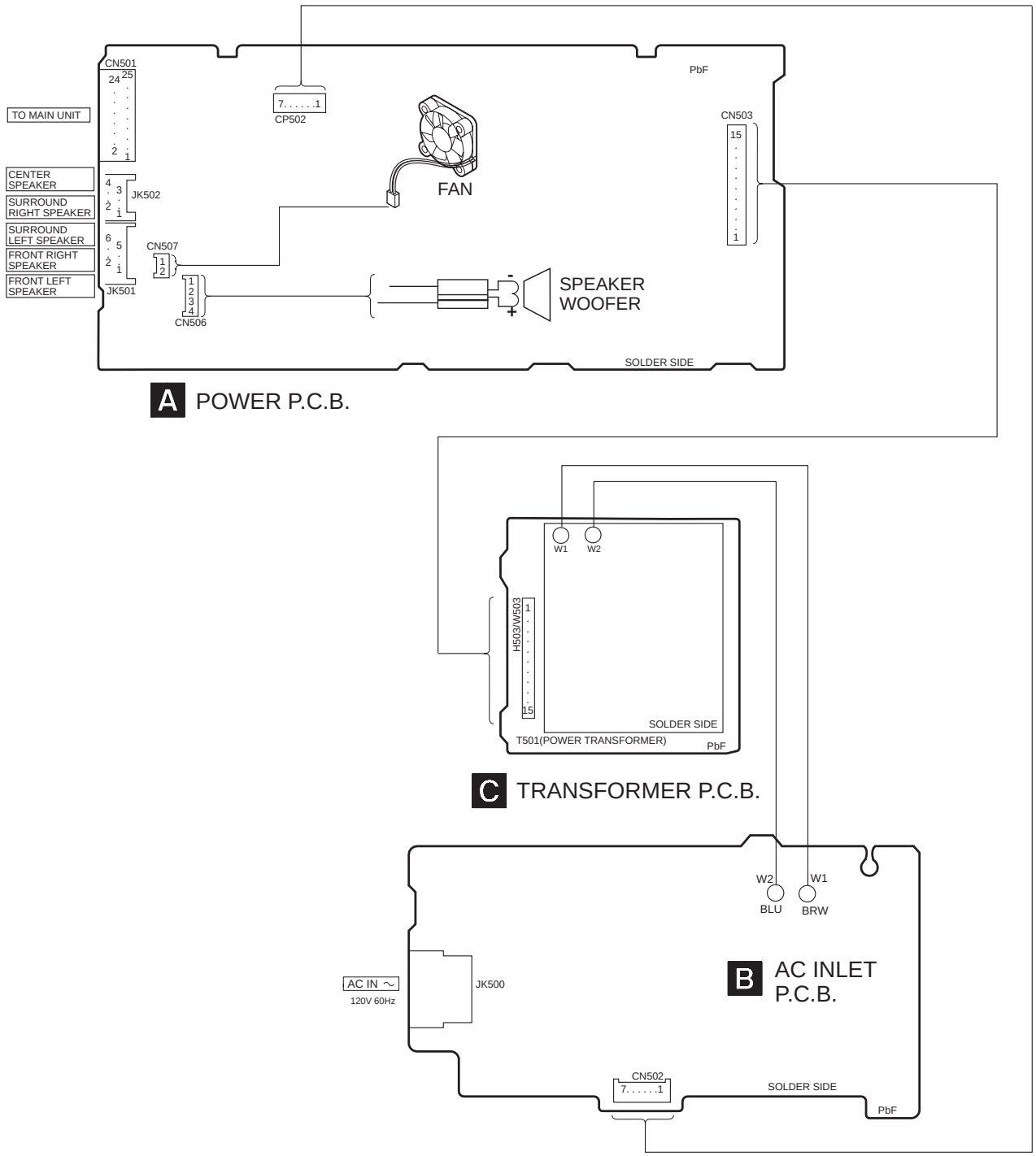
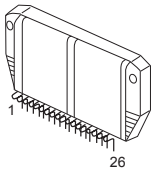
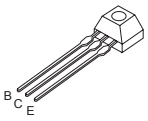
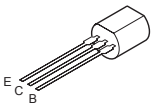
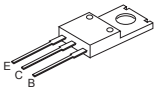
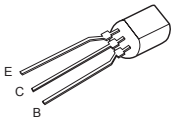
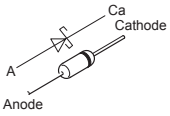
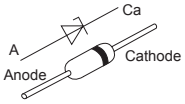
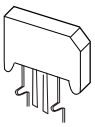
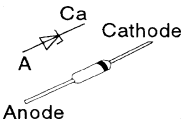
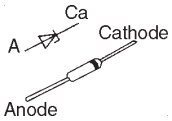
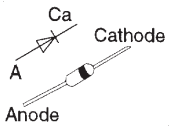
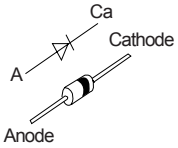
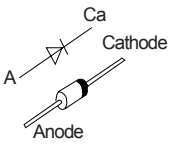
11.2. AC Inlet P.C.B. and Transformer P.C.B.



12 Wiring Connection Diagram



13 Illustration of IC's, Transistors and Diodes

RSN311W64D-P 	B1GCCFJJ0015 B1GACFJJ0016 B1AACF000089 	B1ACCF000063 	B1BCCG000021 B1BACG000036 	2SD0592ARA 
MA2C700A0F 	B0BA5R100013 B0BA6R600008 	B0FBAM000009 	B0BA5R600016 	B0BA01900005 B0BA01100004 
B0AACK000004 	B0EAKM000122 	B0JAPG000019 B0EAKM000117 		

14 Parts Location and Replacement Parts List

Notes:

- Important safety notice:

  Components identified by ⚠ mark have special characteristics important for safety.

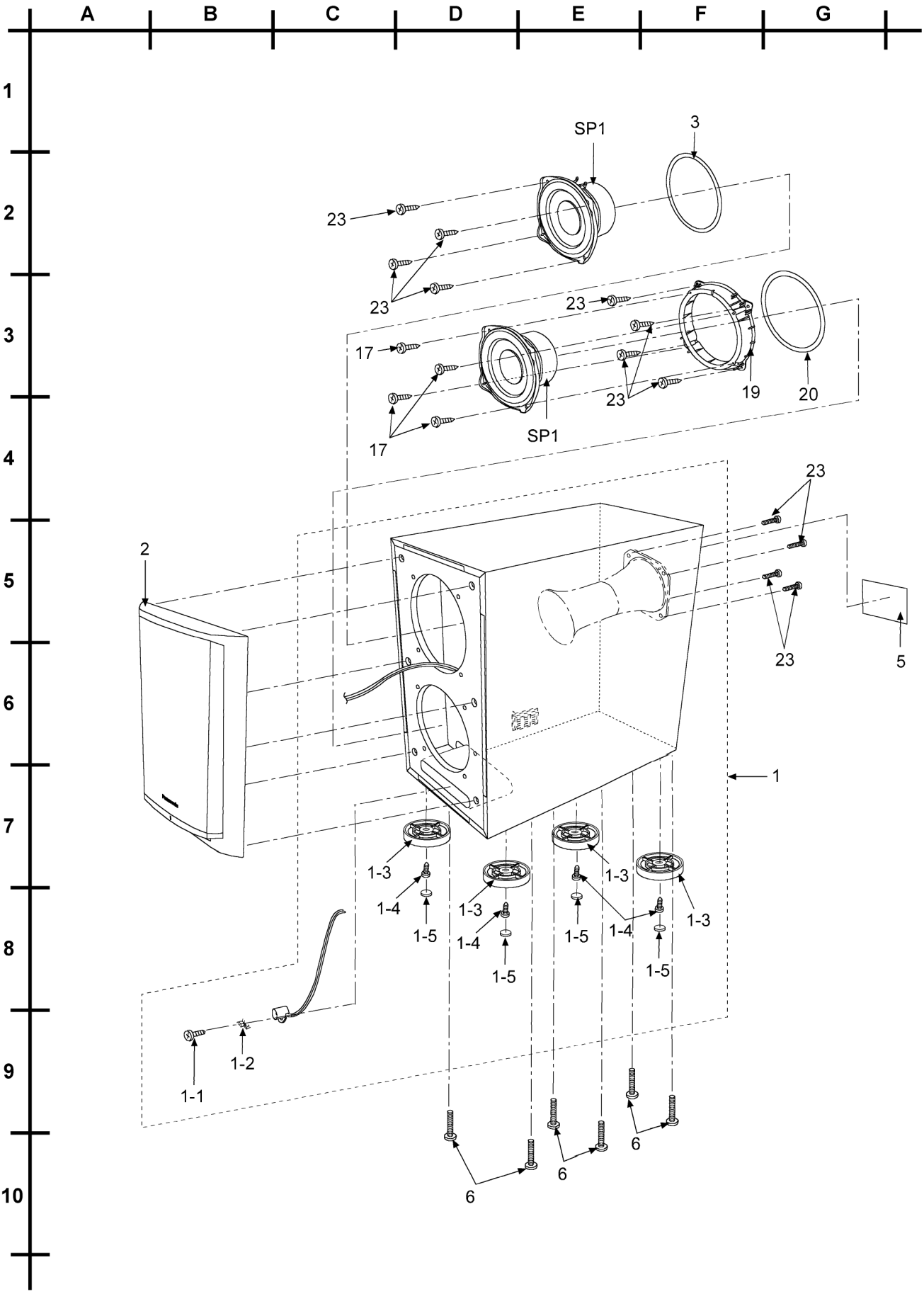
  Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low noise (resistors), etc are used.

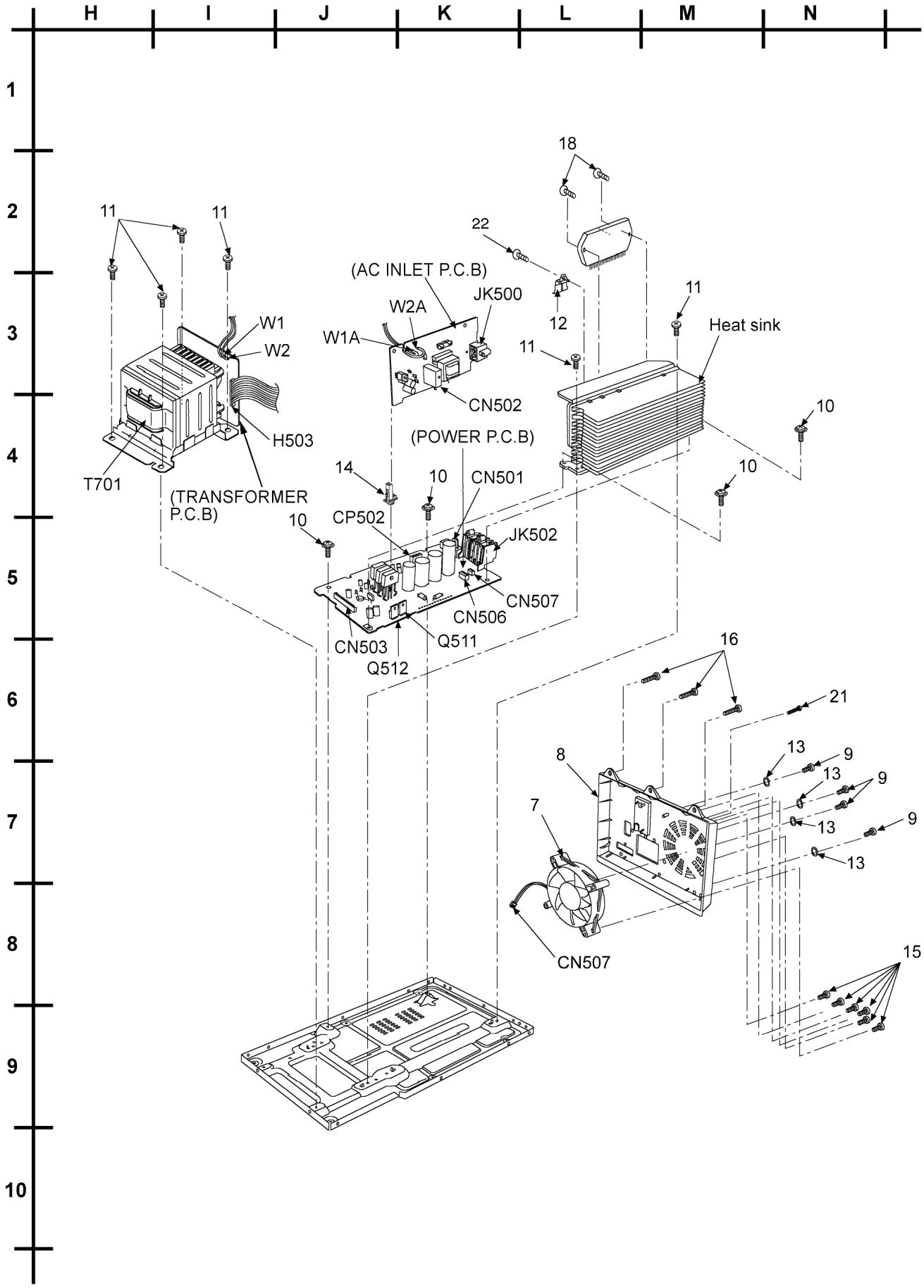
  When replacing any of these components, be sure to use only manufacturer's specified parts shown in the parts list.
- The parenthesized indications in the Remarks columns specify the areas or colour. (Refer to the cover page for area or colour)

  Parts without these indications can be used for all areas.
- Capacitor values are in microfarads (μF) unless specified otherwise, P= Pico-farads (pF), F= Farads.
- Resistance values are in ohms, unless specified otherwise, 1K=1,000 (OHM).
- The marking (RTL) indicates that the Retention Time is limited for this items. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of a availability is dependent on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.
- [M] Markings in the Remarks columns indicates parts supplied by **PAVCSG.**

14.1. Cabinet

14.1.1. Cabinet Parts Location




H
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4
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8
9
10
11
11
W1
W2
H503
T701
(TRANSFORMER P.C.B)
(AC INLET P.C.B)
W2A
W1A
JK500
CN502
18
22
12
11
Heat sink
10
(POWER P.C.B)
14
10
CN501
10
CP502
JK502
CN507
CN506
CN503
Q511
Q512
16
21
13
9
13
9
13
9
13
8
7
CN507
15

14.1.2. Cabinet Parts List

Ref. No.	Part No.	Part Name & Description	Remarks
		CABINET AND CHASSIS	
1	RFKHBWA730PP	SUB WOOFER CAB ASS'Y	[M]
1-1	XTB3+12GFJ	SCREW	[M]
1-2	B3AAA0000583	LED (RED)	[M]
1-3	RGKX0284-H	LEG	[M]
1-4	XTB4+12AFJ	WOOD SCREW (TBZP)	[M]
1-5	RKAX0019-KJ	LEG CUSHION	[M]
2	RYQX0167-S	FRONT PANEL UNIT	[M]
3	RMQX0106	EVA PACKING (WOOFER)	[M]
5	RGNX0273-S	SPEC LABEL	[M]
6	XTS4+16JFJ	SCREW (TBZP)	[M]
7	REM0072-4	FAN	[M]
8	RGRX0040A-H	REAR PANEL	[M]
9	RHD30065-1S	SCREW (TBZP)	[M]
10	RHD30090-1	SCREW	[M]
11	RHD30119	SCREW	[M]
12	RMC0158-S2	TR-FIXTURE	[M]
13	RMG0606-K	FAN INSULATOR	[M]
14	RMN0203	PCB HOLDER	[M]
15	XTB3+10JFJ	SCREW	[M]
16	XTB3+16AFJ	SCREW (TBZP)	[M]
17	XTB4+10GFJ	SCREW (TBZP)	[M]
18	XTW3+15TFJ	SCREW (TBZP)	[M]
19	RGPX0174	WOOFER SPACER	[M]
20	RMQX0108	EVA PACKING (W.SP)	[M]
21	XTN26+10JFJ	SCREW	[M]
22	RHD30119-S	SCREW	[M]
23	XTB4+15AFJ	SCREW (TBZP)	[M]

14.2. Electrical Parts List

Ref. No.	Part No.	Part Name & Description	Remarks
		PRINTED CIRCUIT BOARD	
	REPX0470A	POWER P.C.B./ AC INLET P.C.B./ TRANSFORMER P.C.B.	[M] RTL
		INTEGRATED CIRCUITS	
IC501	RSN311W64D-P	IC HIC (PBF)	[M]
		TRANSISTORS	
Q501	B1AACF000089	TRANSISTOR	[M]
Q502	B1AACF000089	TRANSISTOR	[M]
Q503	B1AACF000089	TRANSISTOR	[M]
Q505	B1AACF000089	TRANSISTOR	[M]
Q506	B1GCCFJJ0015	TRANSISTOR	[M]
Q511	B1BACG000036	TRANSISTOR	[M]
Q512	B1BCCG000021	TRANSISTOR	[M]
Q515	B1AACF000089	TRANSISTOR	[M]
Q516	B1GACFJJ0016	TRANSISTOR	[M]
Q517	B1BACG000036	TRANSISTOR	[M]
Q519	B1AACF000089	TRANSISTOR	[M]
Q520	B1GCCFJJ0015	TRANSISTOR	[M]
Q552	B1ACCF000063	TRANSISTOR	[M]
Q553	2SD0592ARA	TRANSISTOR	[M]
Q554	B1ACCF000063	TRANSISTOR	[M]
Q555	2SD0592ARA	TRANSISTOR	[M]
Q556	B1ACCF000063	TRANSISTOR	[M]
Q557	2SD0592ARA	TRANSISTOR	[M]
		DIODES	
D500	B0AACK000004	DIODE	[M]
D501	B0JAPG000019	DIODE	[M]
D502	B0JAPG000019	DIODE	[M]
D503	MA2C700A0F	DIODE	[M]
D504	B0AACK000004	DIODE	[M]
D508	B0AACK000004	DIODE	[M]
D509	B0BA5R100013	DIODE	[M]
D510	B0BA5R600016	DIODE	[M]
D525	B0BA6R600008	DIODE	[M]
D527	B0EAKM000122	DIODE	[M]
D528	B0EAKM000122	DIODE	[M]
D555	B0AACK000004	DIODE	[M]
D556	B0BA01100004	DIODE	[M]
D557	B0EAKM000117	DIODE	[M]
D558	B0AACK000004	DIODE	[M]
D559	B0AACK000004	DIODE	[M]
D560	B0AACK000004	DIODE	[M]
D561	B0BA01100004	DIODE	[M]
D562	B0AACK000004	DIODE	[M]
D563	B0BA01900005	DIODE	[M]
D564	B0BA01900005	DIODE	[M]
D565	B0BA01900005	DIODE	[M]
D566	B0BA01900005	DIODE	[M]
D597	B0FBAM000009	DIODE	[M]
D598	B0FBAM000009	DIODE	[M]
D599	B0FBAM000009	DIODE	[M]
		CONNECTORS	
CN501	K1FB125B0095	SYSTEM CONNECTOR	[M]
CN502	K1KB07B00020	CONNECTOR	[M]
CN503	K1KA15A00159	15P CONNECTOR	[M]
CN506	K1KA04A00105	4P CONNECTOR	[M]
CN507	K1KA02A00008	2P CONNECTOR	[M]
CP502	K1KA07A00123	7P CONNECTOR	[M]
T501	G4C7AHD00004	POWER TRANSFORMER	[M] ⚠
T502	G4C2AAJ00005	BACK-UP TRANSFORMER	[M] ⚠

Ref. No.	Part No.	Part Name & Description	Remarks
		COMPONENT COMBINATION	
Z501	ERZV10V511CS	ZENER	[M] ⚠
		SPEAKER	
SP1	EAS13PL20A	13CM SPEAKER UNIT	[M]
		RELAY	
RLY501	K6B1AEA00003	MAGNET RELAYS	[M] ⚠
		FUSE	
F1	K5D502AQ0004	FUSE	[M] ⚠
		FUSE HOLDERS	
FC501	EYF52BCY	FUSE HOLDER	[M]
FC502	EYF52BCY	FUSE HOLDER	[M]
		FUSE PROTECTOR	
FP1	K5G502AA0002	5A FUSE PROTECTOR	[M] ⚠
		HOLDER	
H503	K1YF15000004	15P WIRE HOLDER	[M]
		JACKS	
JK500	K2AB2B000002	JK AC INLET	[M] ⚠
JK501	K4BC06B00055	JK SPEAKER TERMINAL	[M]
JK502	K4BC04B00107	JK SPEAKER	[M]
		EARTH TERMINALS	
E500	K4CZ01000027	TERMINAL	[M]
E501	K4CZ01000027	TERMINAL	[M]
		WIRES	
W1	REEX0459	PRIMARY WIRE (BROWN)	[M]
W2	REEX0458	PRIMARY WIRE (BLUE)	[M]
W500	REXX0456	15P STRAND TYPE WIRE	[M]
		RESISTORS	
R401	ERDS2TJ224T	220K 1/4W	[M]
R402	ERDS2TJ102T	1K 1/4W	[M]
R500	ERC12UGK335D	3.3M 1/2W	[M]
R501	ERDS2TJ472T	4.7K 1/4W	[M]
R502	ERDS2TJ472T	4.7K 1/4W	[M]
R503	ERDS2TJ153T	15K 1/4W	[M]
R504	ERDS2TJ153T	15K 1/4W	[M]
R505	ERDS2TJ153T	15K 1/4W	[M]
R506	ERDS2TJ153T	15K 1/4W	[M]
R507	ERDS2TJ392T	3.9K 1/4W	[M]
R508	ERDS2TJ392T	3.9K 1/4W	[M]
R509	ERDS2TJ472T	4.7K 1/4W	[M]
R510	ERDS2TJ472T	4.7K 1/4W	[M]
R511	ERDS2TJ153T	15K 1/4W	[M]
R512	ERDS2TJ153T	15K 1/4W	[M]
R513	ERDS2TJ563T	56K 1/4W	[M]
R514	ERDS2TJ563T	56K 1/4W	[M]
R515	ERDS2TJ563T	56K 1/4W	[M]
R516	ERDS2TJ563T	56K 1/4W	[M]
R517	ERDS2TJ563T	56K 1/4W	[M]
R518	ERDS2TJ563T	56K 1/4W	[M]
R519	ERDS2TJ824T	820K 1/4W	[M]
R520	ERDS2TJ223T	22K 1/4W	[M]
R521	ERDS2TJ103T	10K 1/4W	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
R522	ERDS2TJ273T	27K 1/4W	[M]
R523	ERDS2TJ124T	120K 1/4W	[M]
R524	ERDS2TJ124T	120K 1/4W	[M]
R525	ERDS2TJ154T	150K 1/4W	[M]
R526	ERDS2TJ124T	120K 1/4W	[M]
R527	ERDS2TJ124T	120K 1/4W	[M]
R528	ERDS2TJ154T	150K 1/4W	[M]
R529	ERDS2TJ223T	22K 1/4W	[M]
R530	ERD25FVJ1R0T	1 1/4W	[M]
R531	ERD25FVJ1R0T	1 1/4W	[M]
R532	ERDS2TJ472T	4.7K 1/4W	[M]
R533	ERDS1FVJ100T	10 1/2W	[M]
R534	ERDS1FVJ100T	10 1/2W	[M]
R535	ERDS1FVJ100T	10 1/2W	[M]
R536	ERDS1FVJ100T	10 1/2W	[M]
R537	ERDS1FVJ100T	10 1/2W	[M]
R538	ERDS1FVJ100T	10 1/2W	[M]
R545	ERDS2TJ224T	220K 1/4W	[M]
R546	ERDS2TJ102T	1K 1/4W	[M]
R547	ERDS2TJ394T	390K 1/4W	[M]
R548	ERDS2TJ334T	330K 1/4W	[M]
R549	ERDS2TJ392T	3.9K 1/4W	[M]
R558	ERDS2TJ104T	100K 1/4W	[M]
R559	ERDS2TJ103T	10K 1/4W	[M]
R560	ERDS2TJ151T	150 1/4W	[M]
R561	ERDS1FVJ392T	3.9K 1/2W	[M]
R562	ERDS2TJ472T	4.7K 1/4W	[M]
R563	ERDS1FVJ102T	1K 1/2W	[M]
R564	ERDS2TJ224T	220K 1/4W	[M]
R565	ERDS1FVJ392T	3.9K 1/2W	[M]
R567	ERDS1FVJ152T	1.5K 1/2W	[M]
R568	ERDS2TJ151T	150 1/4W	[M]
R569	ERDS1FVJ182T	1.8K 1/2W	[M]
R570	ERDS2TJ103T	10K 1/4W	[M]
R571	ERDS1FVJ182T	1.8K 1/2W	[M]
R577	ERDS2TJ152T	1.5K 1/4W	[M]
R578	ERDS2TJ103T	10K 1/4W	[M]
R579	ERDS2TJ332T	3.3K 1/4W	[M]
R580	ERDS2TJ220T	22 1/4W	[M]
R581	ERDS2TJ682T	6.8K 1/4W	[M]
R582	ERDS2TJ224T	220K 1/4W	[M]
R583	ERDS2TJ101T	100 1/4W	[M]
R584	ERDS2TJ473T	47K 1/4W	[M]
R587	ERDS2TJ272T	2.7K 1/4W	[M]
R588	ERDS2TJ151T	150 1/4W	[M]
R589	ERDS2TJ103T	10K 1/4W	[M]
R590	ERDS2TJ102T	1K 1/4W	[M]
R600	ERDS2TJ473T	47K 1/4W	[M]
R601	ERDS2TJ473T	47K 1/4W	[M]
R602	ERDS2TJ472T	4.7K 1/4W	[M]
R603	ERDS2TJ103T	10K 1/4W	[M]
R604	ERDS2TJ225T	2.2M 1/4W	[M]
R606	ERG2SJ220E	22 2W	[M]
R609	ERDS1FVJ152T	1.5K 1/2W	[M]
R610	ERD2FCVJ4R7T	4.7 1/4W	[M]
		CAPACITORS	
C501	ECBT1H102KB5	1000P 50V	[M]
C502	ECBT1H102KB5	1000P 50V	[M]
C503	ECBT1H102KB5	1000P 50V	[M]
C504	ECBT1H102KB5	1000P 50V	[M]
C505	ECBT1H102KB5	1000P 50V	[M]
C506	ECBT1H102KB5	1000P 50V	[M]
C507	ECBT1H180JC5	18P 50V	[M]
C508	ECBT1H180JC5	18P 50V	[M]
C509	ECBT1H220JC5	22P 50V	[M]
C510	ECBT1H220JC5	22P 50V	[M]
C511	ECBT1H220JC5	22P 50V	[M]
C512	ECBT1H220JC5	22P 50V	[M]
C513	F1D1H473A012	0.047 50V	[M]
C514	ECEA0JKA101B	100 6.3V	[M]
C515	F1B2H103A060	0.01 500V	[M]

Ref. No.	Part No.	Part Name & Description	Remarks
C516	F1B2H103A060	0.01 500V	[M]
C517	ECBT1C103NS5	0.01 16V	[M]
C518	F1D1H473A012	0.047 50V	[M]
C519	F1D1H473A012	0.047 50V	[M]
C520	F1D1H473A012	0.047 50V	[M]
C521	F1D1H473A012	0.047 50V	[M]
C522	F1D1H473A012	0.047 50V	[M]
C523	F1D1H473A012	0.047 50V	[M]
C529	F1D1H1040002	0.1 50V	[M]
C530	ECBT1H102KB5	1000P 50V	[M]
C531	ECBT1H102KB5	1000P 50V	[M]
C532	ECBT1H102KB5	1000P 50V	[M]
C533	ECBT1H102KB5	1000P 50V	[M]
C534	ECA1HM330B	33 50V	[M]
C543	ECBT1H102KB5	1000P 50V	[M]
C544	ECA1HM101B	100 50V	[M]
C545	F1D1H1040002	0.1 50V	[M]
C546	ECA1SM332C5	3300 100V	[M]
C547	ECA1SM472C5	4700 100V	[M]
C548	ECA1SM472C5	4700 100V	[M]
C549	ECA1SM332C5	3300 100V	[M]
C550	ECBT1C103NS5	0.01 16V	[M]
C551	ECBT1H103KB5	0.01 50V	[M]
C553	ECQE2104KF3	0.1 250V	[M]
C554	ECQE1104KF3	0.1 100V	[M]
C555	ECEA1VKA4R7B	4.7 35V	[M]
C556	ECBT1H103KB5	0.01 50V	[M]
C557	ECEA1AKA470B	47 10V	[M]
C558	ECA1CM102B	1000 16V	[M]
C559	ECBT1H103KB5	0.01 50V	[M]
C560	ECA1HM100B	10 50V	[M]
C569	F1D1H473A012	0.047 50V	[M]
C570	ECA1EM331B	330 25V	[M]
C571	ECA1CM102B	1000 16V	[M]
C572	ECA1HM101B	100 50V	[M]
C573	ECBT1H102KB5	1000P 50V	[M]
C574	ECBT1H103KB5	0.01 50V	[M]
C575	ECBT1H103KB5	0.01 50V	[M]
C576	F2J1H100A048	10P 50V	[M]
C577	ECEA1CKA100B	10 16V	[M]
C578	ECBT1H103KB5	0.01 50V	[M]
C579	ECBT1H103KB5	0.01 50V	[M]
C580	ECEA1HKA2R2B	2.2 50V	[M]
C647	ECA0JM471B	470 6.3V	[M]

14.3. Packing Materials & Accessories Parts List

Ref. No.	Part No.	Part Name & Description	Remarks
		PACKING MATERIALS	

Ref. No.	Part No.	Part Name & Description	Remarks
P1	RPNX0295	POLYFOAM (ASW)	[M]
P2	RPFX0071	MIRAMAT BAG	[M]

14.4. Packaging